Realistic Expectations for ELR and PHIN: Lessons Learned During Testing of the NBS

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ELR in One Word – 'Complicated'

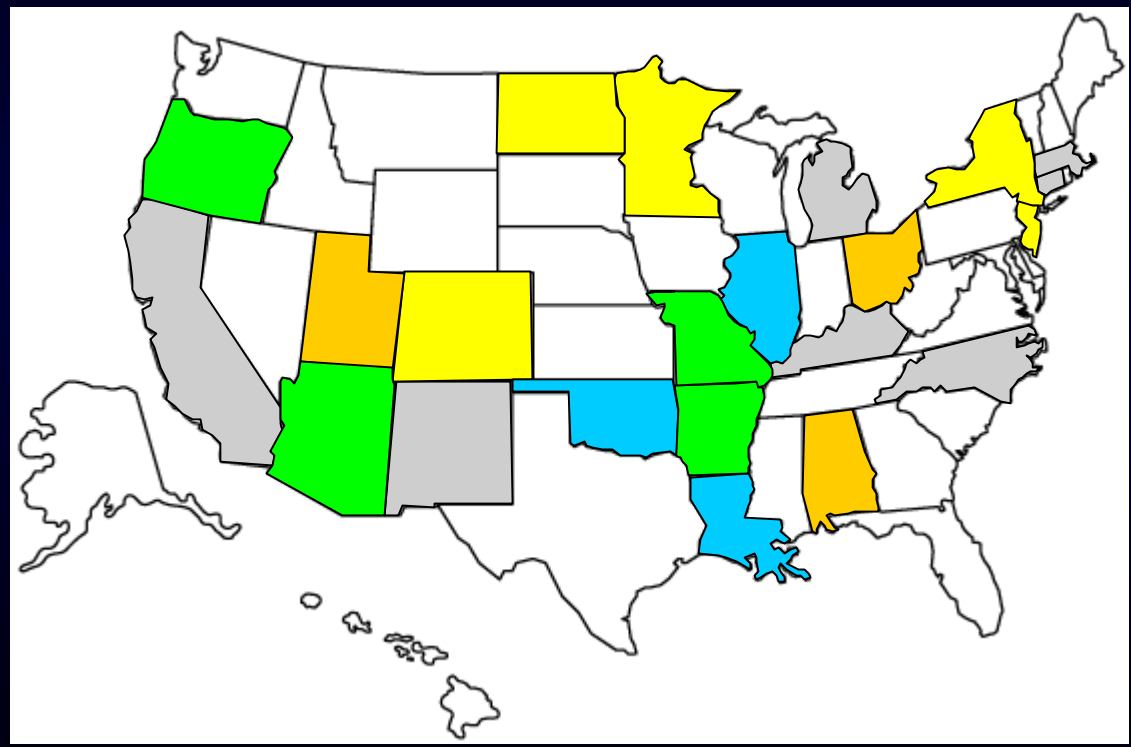
- Many ELR variables/variations
  - Currently occurring
  - Continuing into foreseeable future
- Main categories of variables
  - Format
  - Content
  - Transmission Methodologies

General ELR Format Variations

- HL7
  - Versions – 2.2, 2.3.z, 2.3.1, 2.4, 2.5, 3.0
  - “Flavors” of each version between labs
  - Parent-child lab differences
- Other text
  - Comma-separated, tab-separated
- Spreadsheet, database, etc.
  - .xls, .dbf, .mdb

National Picture – HL7 Versions Accepted*

None	2.3.z	2.3.1	2.3.z+2.3.1	>two



* Self-identified states, ELR National Teleconference Group website

General ELR Content Variations

- Record level
  - Batch reporting
  - Single-record web entry
- Coding
  - Standards - LOINC, SNOMED, HL7, others
  - Local code sets
- Available fields

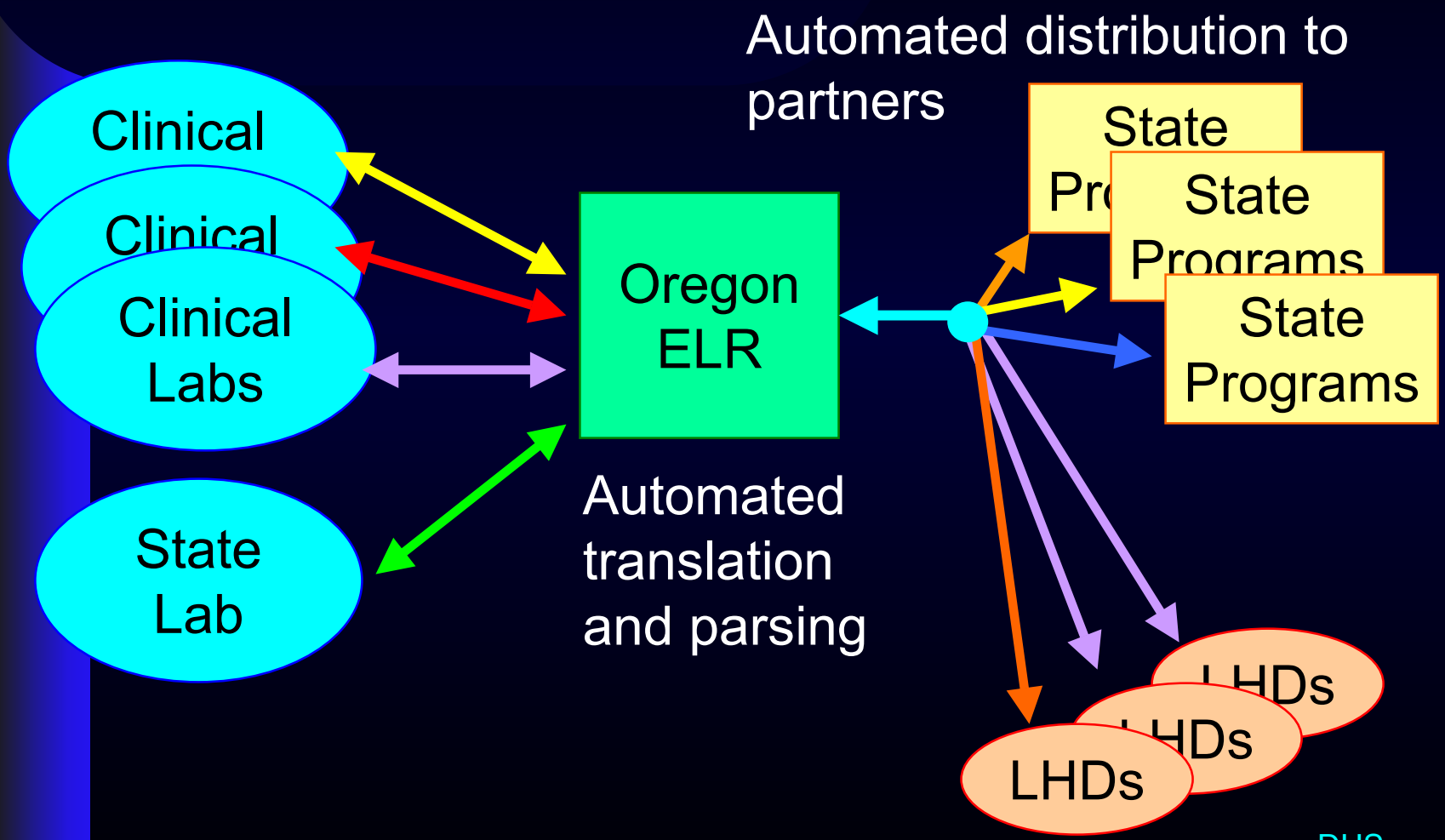
General ELR Transmission Variations

- Methodologies
  - PHIN MS
  - VPN, sFTP
  - Modem
  - Web portals
- Control issues
  - Lab willingness to install external software/hardware
  - Who controls security? Ex. Modem - Server

Oregon ELR

- ELR program began in 2000
- Base - Sybase translation and messaging applications
- State currently testing the NEDSS Base System for utility within our environment

Oregon ELR Nucleus



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Oregon ELR Format Variations

- All Oregon ELR (source data) using HL7 format
- But - different versions and 'flavors'
  - +/- File and Batch segments
  - Subcomponents – some labs produce, others cannot; also different subcomponent content
  - Notes – sometimes appear in NTEs, sometimes in OBXs
  - +/- Z segment (most labs use 2.3.z or 2.3.1)
  - Z segment differences – not all lab partners use our regional standard HL7 message
  - CR/CRLF variations – depend on source app

Oregon ELR Format Variations

- ELR data distributed to partners in various formats
  - State partners: their choice of formats. Current report formats include .dbf, .mdb, .xls
  - LHD Automated fax (.txt) – used by all counties
  - LHD pilot – direct data transfer (.mdb, .xls, .dbf)
- ELR-associated data includes these formats as well as XML

Oregon ELR Content Variations

- Record level
  - Batch reporting
  - Single-record files
- Coding
  - LOINC, SNOMED, ICD (for ED reporting), HL7
  - Local code sets - many
- Available fields - examples
  - Reference range
  - Demographic information

Oregon ELR Transmission Variations

- Current Supported Methodologies
  - VPN (Virtual Private Network)
  - sFTP (secure File Transfer Protocol)
  - Asynchronous modem
  - File pick-up from secure web site
- Control issues
  - Provide free client VPN software, but some partners reluctant to allow outside software
  - Modem transfer security - support dial-out but not dial-in

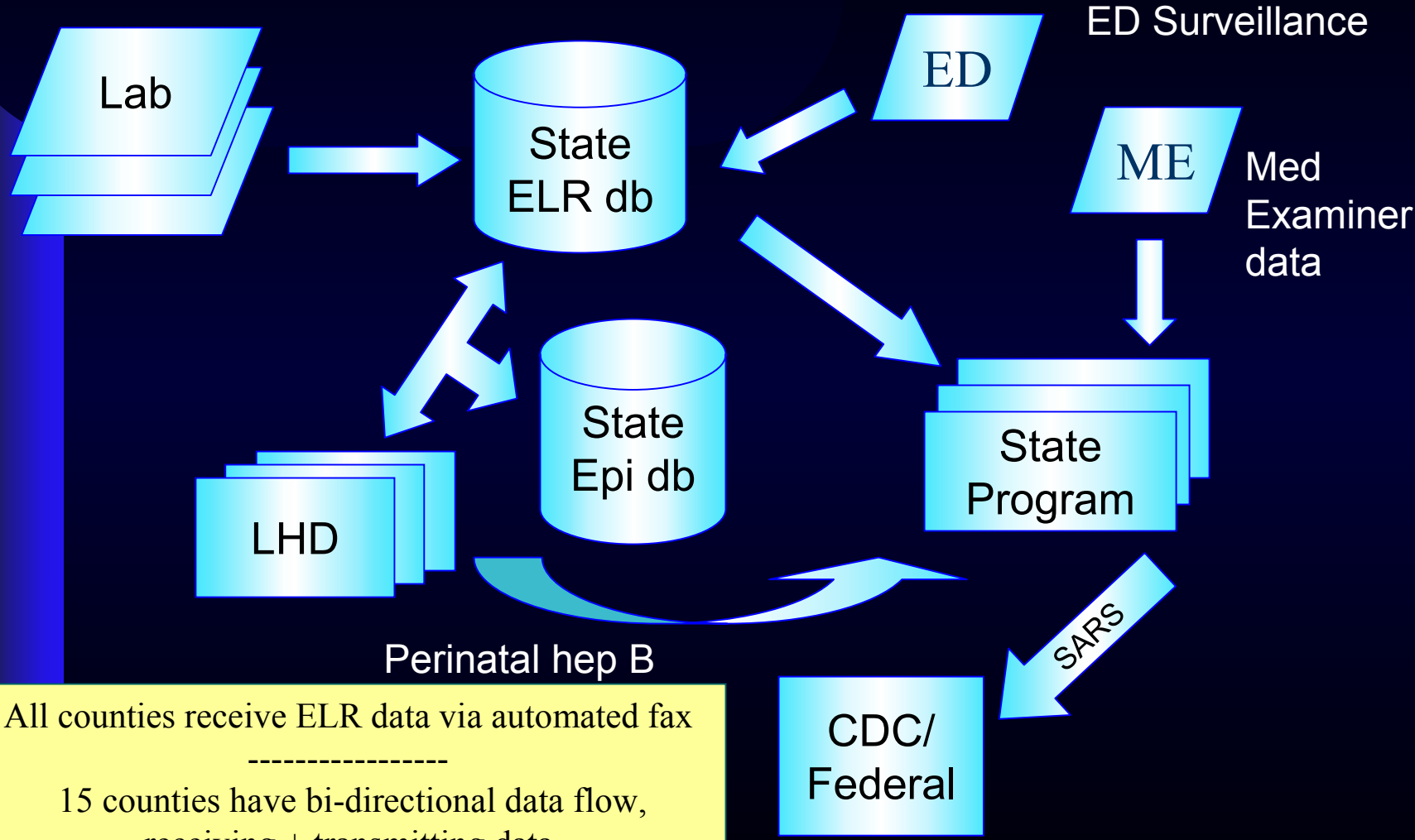
Oregon ELR Enhancements – An Integrated Subsystem

- Current extensions from the ELR nucleus
  - Emergency Department Surveillance
  - LHD Communicable Disease Data Exchange pilots
    - County reports transmitted to state system
    - Direct electronic transfer of lab data to counties
  - Perinatal Hepatitis B Data Interchange
  - Miscellaneous data interchange – Medical Examiner
  - SARS – XML to CDC

Oregon ELR Enhancements – An Integrated Subsystem

- Current extensions from the ELR nucleus
- Future extensions
  - Pathology Reporting – Cancer Registry
  - Data interchange with neighboring states
  - Poison Control Data
  - Hepatitis C reporting

Oregon ELR Overview



All counties receive ELR data via automated fax

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15 counties have bi-directional data flow, receiving + transmitting data

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4 counties transmit hep b data

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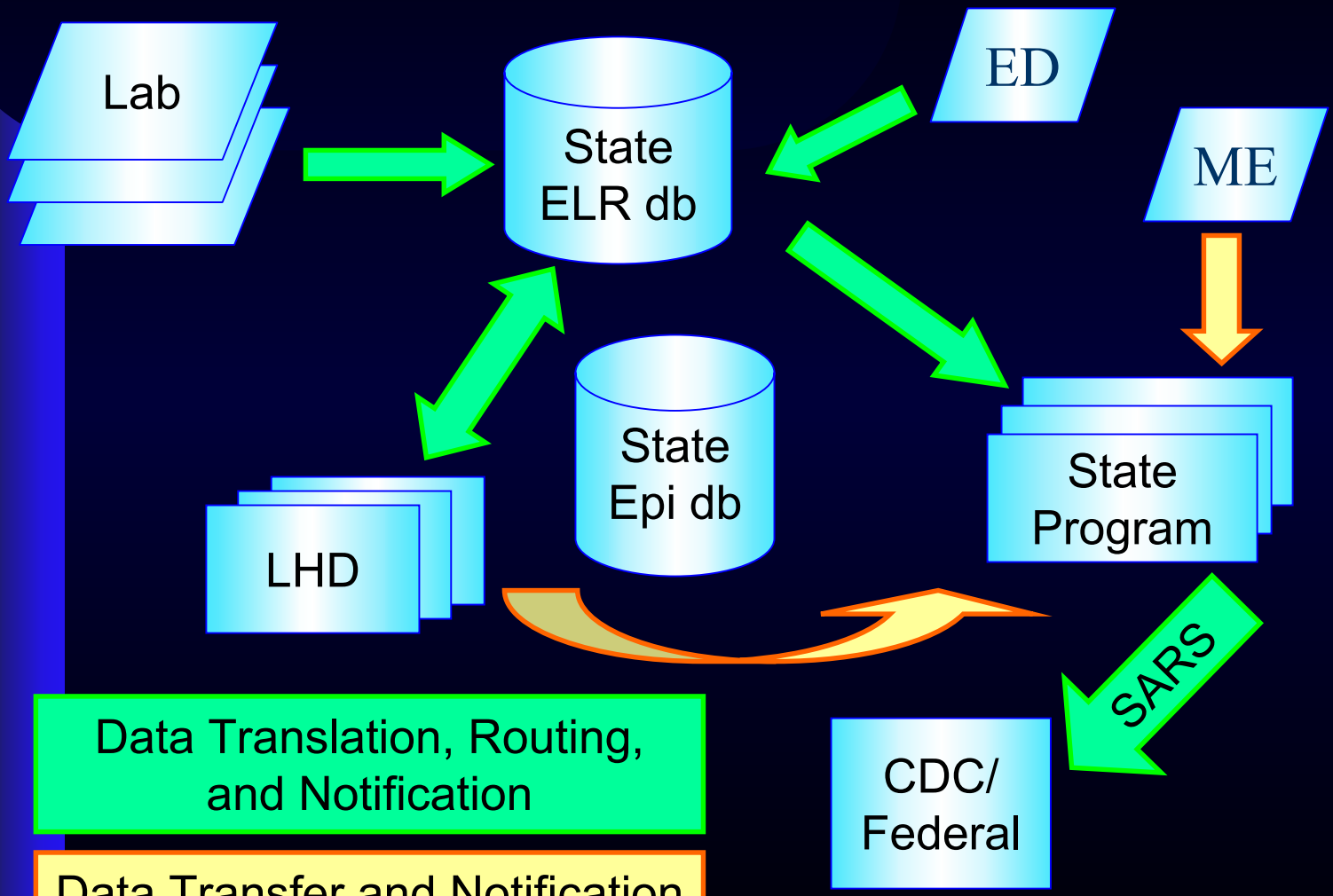
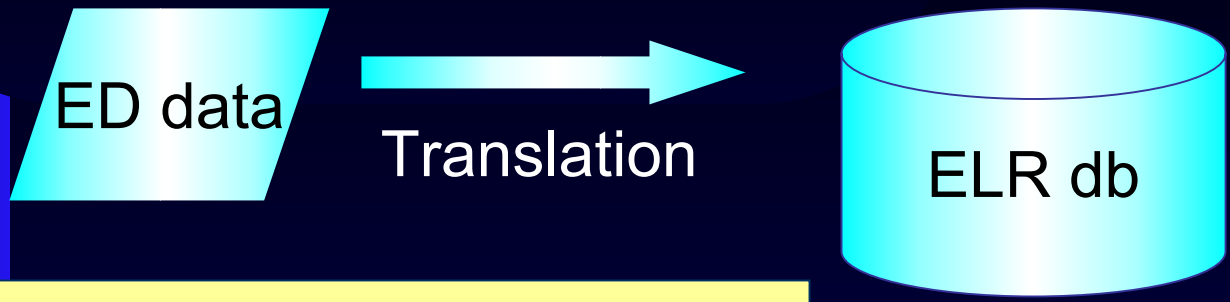
Oregon ELR Overview

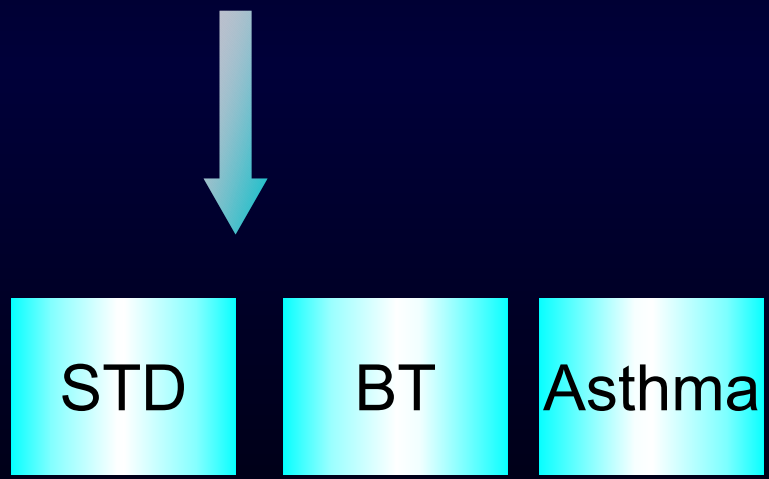


Emergency Department Reporting



ED reports differ from lab data:
A) ICD Codes
B) Clinical data (temperature, respiration rate, pulse, etc.)

ED data merged with ELR data for several state programs, but not forwarded to LHDs

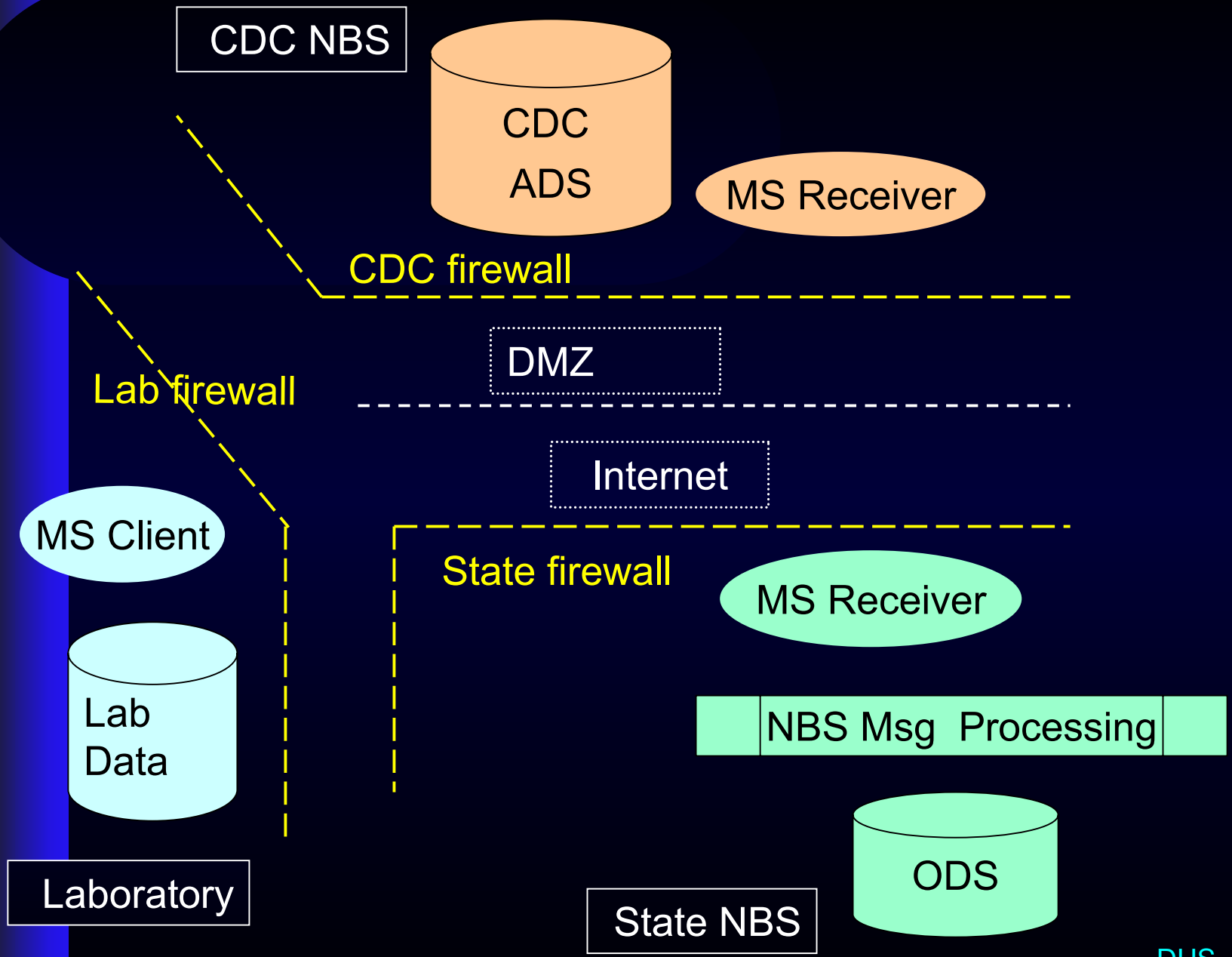


NBS Possibilities

- Oregon Goal – Retain and enhance existing ELR functionalities
  - Must maintain current interfaces
  - Have flexibility to add new interfaces
- How to incorporate existing ELR with NBS?
  - Options identified for data import into NBS
  - Pros and Cons determined

PHIN MS and NBS

- PHIN Messaging System - PHIN MS
- NEDSS Base System – NBS
- Oregon currently testing the NBS in our environment



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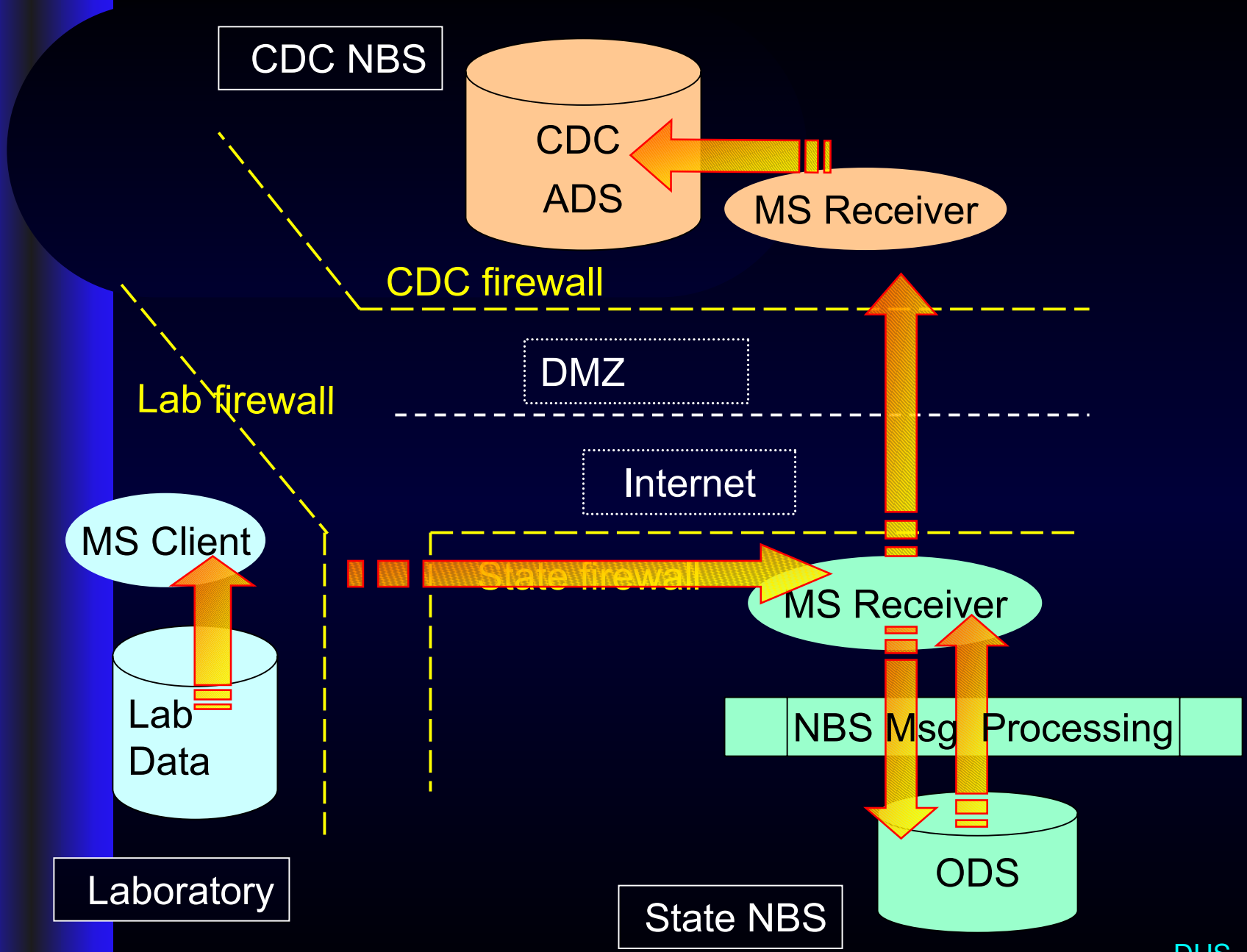

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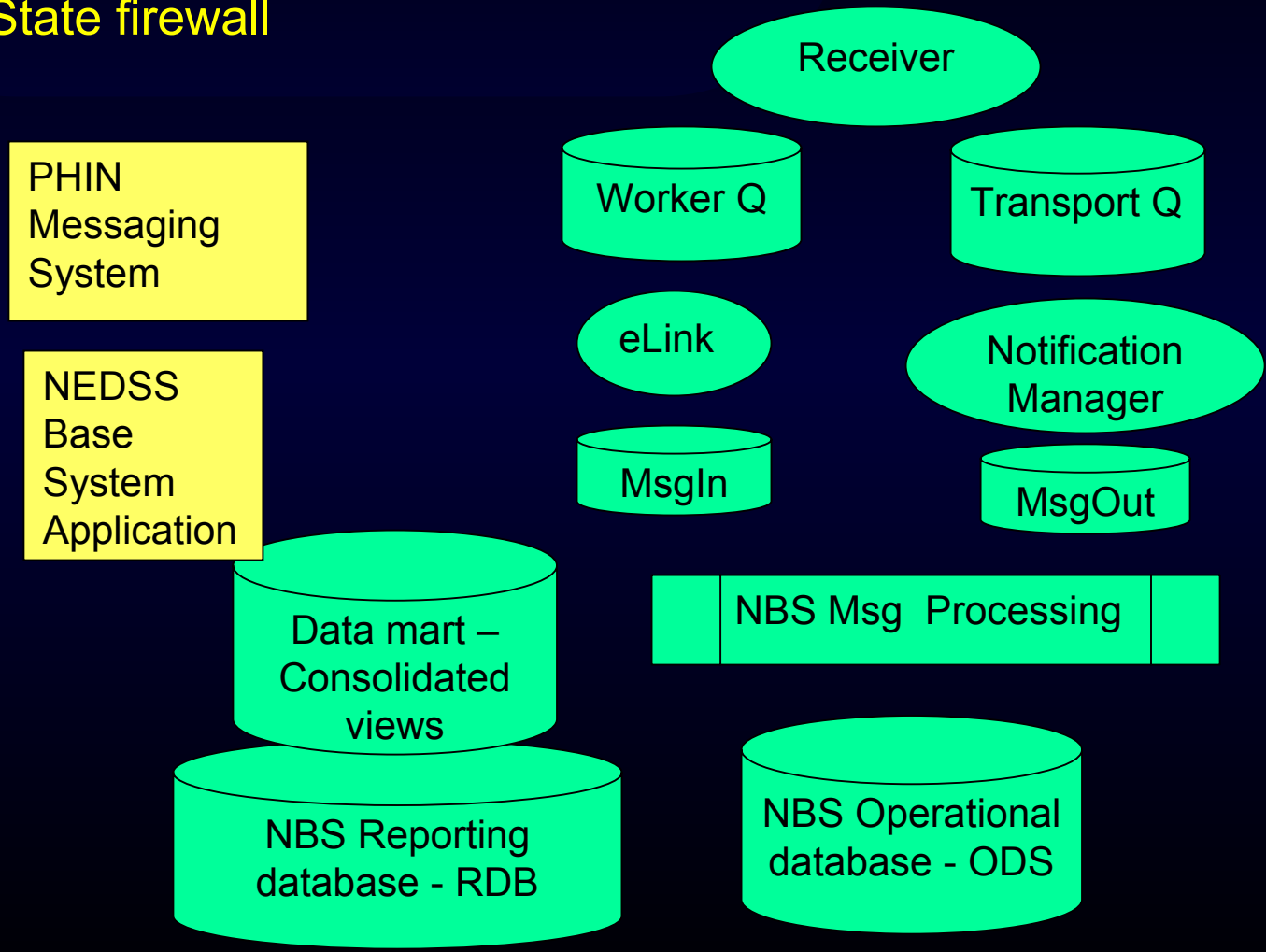
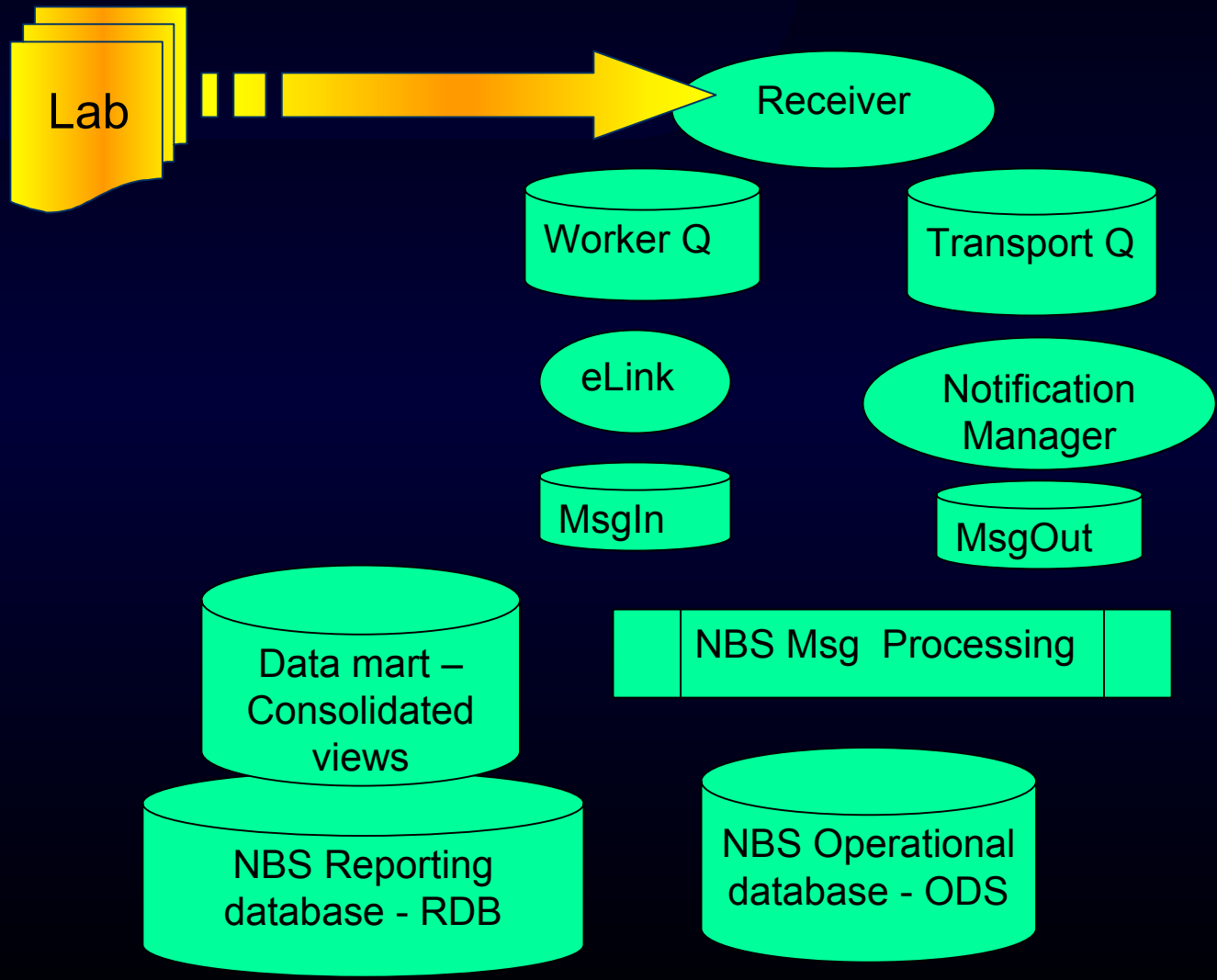
State PHINMS and NBS

State firewall



ELR Data Import Options

- Direct messaging from laboratories into the NBS

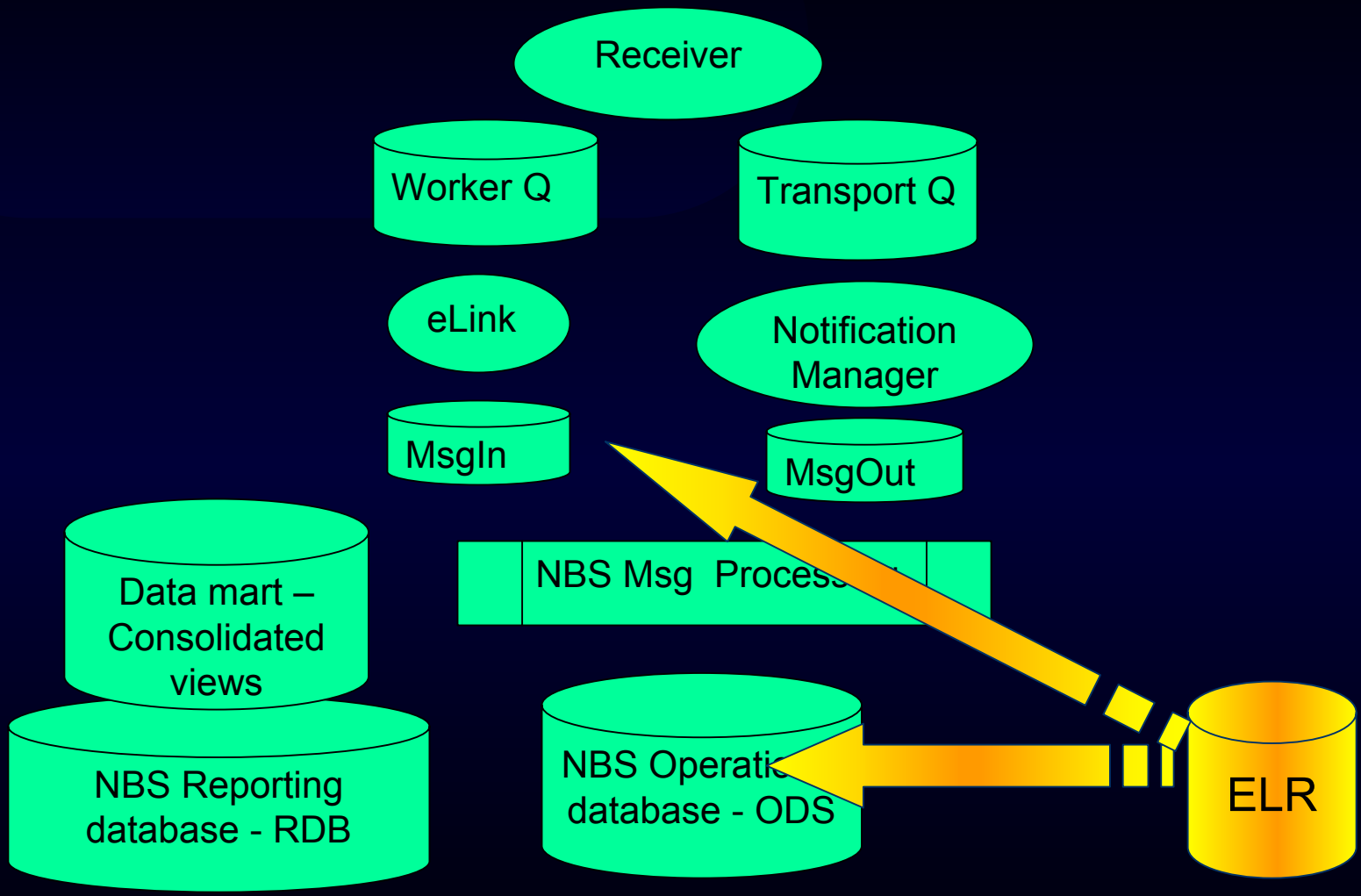

Lab
Receiver
Worker Q
Transport Q
eLink
Notification Manager
MsgIn
MsgOut
Data mart – Consolidated views
NBS Msg Processing
NBS Reporting database - RDB
NBS Operational database - ODS

Direct Messaging from Laboratories into the NBS

- Pro: No additional data steps/setup
- Con: Problematic issues include
  - Accommodation of variety of HL7 formats and 'flavors‘
  - Need to support extensive local code sets (current reality in Oregon)
  - Developing new interfaces not easy

ELR Data Import Options

- Direct messaging from laboratories into the NBS
- Direct data import - into the NBS Operational Data Store/Message In database - from the ELR database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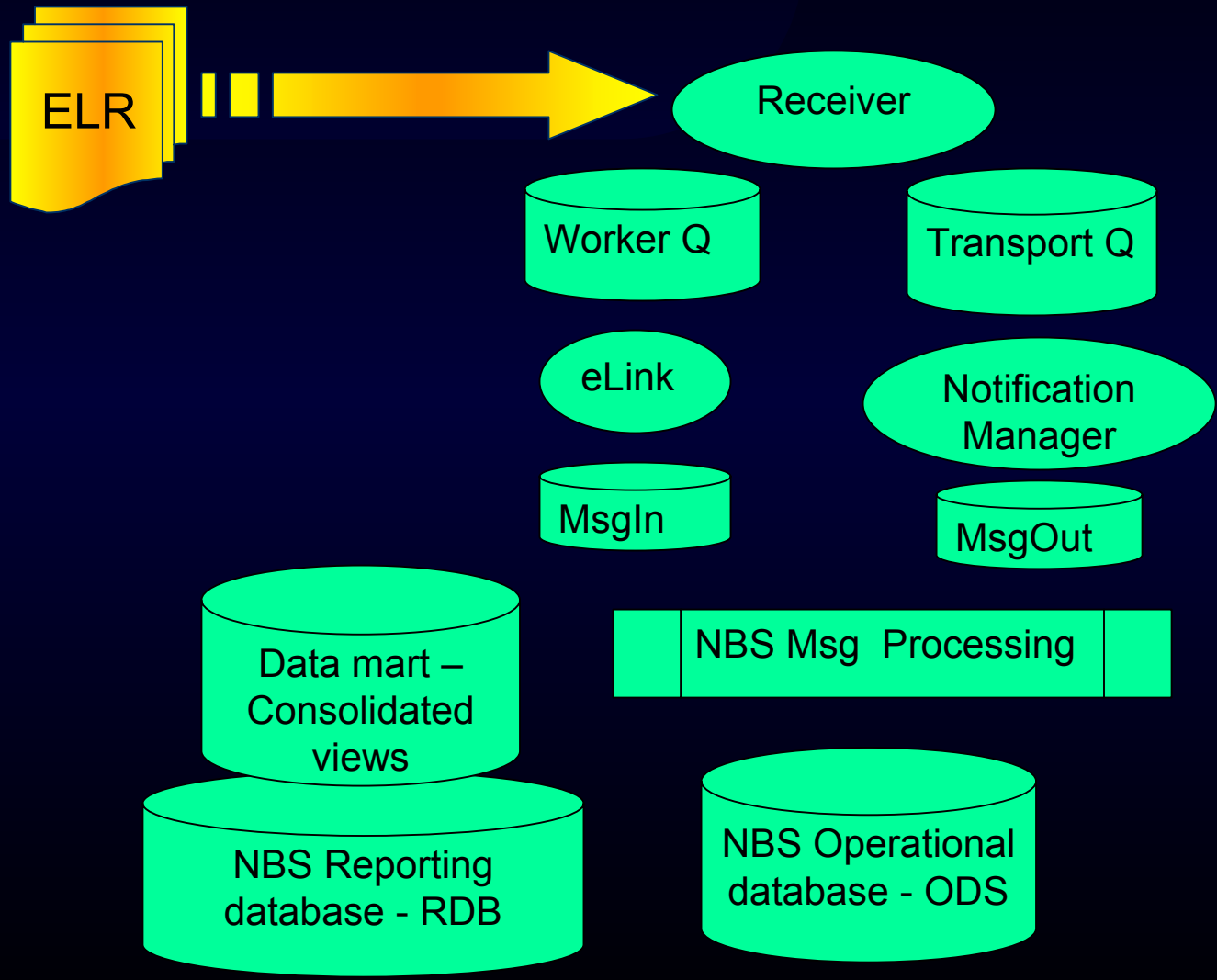
ELR

Direct Data Import into NBS db from an ELR Database

- Pro:
  - Standardization, correction, and normalization of format, content, and coding occurs as reports process into ELR db, ∴ easier import to NBS
  - Ability to create flexible and new interfaces
  - Control acceptance of HL7 versions, local coding, and non-HL7 message formats
- Con: Requires effort to set up data import processes

ELR Data Import Options

- Direct messaging from laboratories into the NBS
- Direct data import - into the NBS Operational Data Store/Message In database - from the ELR database
- Messaging import from the ELR database into NBS Receiver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Messaging Import from ELR Database into NBS Receiver

- Pro:
  - All of the Pros from previous option
- Con:
  - Problematic version control for messaging
  - As NBS evolves, changes in HL7 versions accepted must be matched by HL7 message from ELR db

Data Import Considerations

- Important to offer options to our trading partners
- An established ELR system has different considerations than a developing system
- Current and future ELR needs will impact a choice between the three import options
- Oregon current plan, option #2: Direct data import into the NBS db from the ELR database

Summary

- Significant time and expertise are necessary to maintain existing interfaces, add new ones
- Flexibility critical to retaining and enhancing existing ELR functionalities
- It is unreasonable to expect any tool to support all these needs and variables "out of the box"